



City of Chattanooga

Mayor Andy Berke

February 23, 2017

VIA CERTIFIED MAIL

Ms. Sara Janovitz
Environmental Engineer
Clean Water Enforcement Branch
US EPA-Region 4
61 Forsyth Street, SW
Atlanta, GA 30303

**Re: *United States of America et. al. v. City of Chattanooga, No. 1:12-cv-0024*
Annual Report No. 4 – January, 2016 to December, 2016**

Dear Ms. Janovitz:

On behalf of the City of Chattanooga, Tennessee ("City"), and in accordance with the Consent Decree entered by the United States District Court for the Eastern District of Tennessee (Southern Division), on April 24, 2013, in the case styled the United States of America et. al. v. City of Chattanooga, No. 1:12-cv-0024 ("Consent Decree"), we are submitting to both the Environmental Protection Agency ("EPA") and the Tennessee Department of Environment and Conservation ("TDEC") the fourth annual report required pursuant to paragraph 40 of the Consent Decree. This report is also being submitted in accordance with the letter from Denise Diaz, dated September 16, 2013, establishing the dates for reporting under the Consent Decree.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering such information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Ms. Sara Janovitz
February 23, 2017
Page Two

Please let me know if you have any questions regarding our submittal.

Sincerely,



Michael C. Patrick, P.E.
Director, Waste Resources Division

Enclosure

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Annual Report No. 4

January 1 - December 31, 2016

Prepared for

**Environmental Protection Agency and
Tennessee Department of Environment and
Conservation**

City of Chattanooga
Waste Resources Division
Consent Decree Program
Case No. 1:12-cv-00245

Prepared by

City of Chattanooga
Waste Resources Division

Submitted by

JACOBS

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Chattanooga, Tennessee

February 23, 2017

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Acronyms and Abbreviations

AOP	Additional Operational Plan
BOD	Biochemical Oxygen Demand
CAP	Capacity Assurance Program
CD	Consent Decree
CMOM	Capacity, Management, Maintenance and Operations
CSOTF	Combined Sewer Overflow Treatment Facility
DO	Dissolved Oxygen
EPA	Environmental Protection Agency
FOG	Fats, Oils, and Grease
FSE	Food Service Establishment
IJA	Inter-Jurisdictional Agreement
ISS	Interceptor Sewer System
KPI	Key Performance Indicator
MBWWTP	Moccasin Bend Wastewater Treatment Plant
MG	Million Gallons
MH	Manhole
N/A	Not Applicable
No.	Number
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
PCCMP	Post Construction Compliance Monitoring Program
PM	Preventive Maintenance
PS	Pump Station
SORP	Sewer Overflow Response Protocol
SSO	Sanitary Sewer Overflow
TDEC	Tennessee Department of Environment and Conservation
TSS	Total Suspended Solids
WQS	Water Quality Standards

1.0 Introduction

1.1 Purpose

On April 24, 2013, the City of Chattanooga (“City”) entered into a Consent Decree with the United States and the State of Tennessee, in the case styled *United States of America et. al. v. City of Chattanooga, No. 1:12-cv-00245* (“CD”). Pursuant to Section IX of the CD, the City is required to submit annual reports on a yearly basis to the Environmental Protection Agency (“EPA”) and Tennessee Department of Environment and Conservation (“TDEC”). Chattanooga has prepared this report to satisfy the reporting requirements found in Paragraph 40 of the CD, which covers the period from January 1, 2016 through December 31, 2016 (“Reporting Period”). This report is also being submitted in accordance with the letter from Denise Diaz, dated September 16, 2013, establishing the dates for the reporting under the CD.

1.2 Requirements

As detailed in Section IX of the CD, the City is required to report a summary of Capacity, Management, Operations and Management (“CMOM”) Program as implemented or modified pursuant to the CD, including a comparison of actual performance with any performance measures that have been established. Additionally, the 1st five annual reports are to include a trends analysis of the number, volume, duration, and cause of Chattanooga’s Sanitary Sewer Overflow (“SSO”) events for a 24-month rolling period, updated to reflect the SSO events that occurred during the previous 12-month period. Beginning with the 6th annual report, this trends analysis will cover SSO events spanning a 5-year rolling period. The Annual Report will also include the status of major Post Construction Compliance Monitoring Program (“PCCMP”) activities, as applicable, relating to the Chattanooga Creek Combined Sewer Overflow Treatment Facilities (“CSOTFs”).

2.0 CMOM Programs

The City is developing its CMOM program pursuant to Paragraph 20 of the CD. As of the end of the Reporting Period, all nine (9) of the nine CMOM programs have been developed by Chattanooga, submitted to TDEC and EPA, and approved. Table 2-1 on the following page summarizes the status of the CMOM Programs, including updates and key performance indicators (“KPIs”) related to implementation of those that have received EPA approval.

**Table 2-1
CMOM Program Summary**

January 1, 2016 - December 31, 2016						
CMOM Program	CMOM Program Status	CD Reference	CMOM Program KPI	CMOM KPI Purpose	Established Performance Measure	Actual Measured Performance
Sewer Overflow Response Protocol ("SORP")	Approved by EPA and TDEC 5/29/2014	Section VI, Paragraph 20(a)(ii)	Maintain records of all sanitary sewer overflow ("SSO") responses and response times	Chattanooga has established a standard SSO Report Form for recording all required SSO related information, maintained via 311 calls, Cityworks Work Orders, and daily work activity summaries	Limit SSO response time to be within one hour after notification of event	Average SSO response time for 2016 was ~11 minutes
Sewer Overflow Response Protocol ("SORP")	Approved by EPA and TDEC 5/29/2014	Section VI, Paragraph 20(a)(ii)	Provide notice to TDEC as required by National Pollutant Discharge Elimination ("NPDES") Permit within 24 hours of being made aware of an SSO event	Chattanooga has identified Interceptor Sewer System ("ISS") staff responsible for compiling SSO report and providing required notification	Notify TDEC of SSO events within 24 hours after being made aware of event	All 24-hour reports were made to TDEC within the 24-hour time period
Inter-Jurisdictional Agreement ("IJA") Program	Approved by EPA and TDEC 9/16/2014	Section VI, Paragraph 20(i)	Adherence to the Implementation Schedule	To ensure that proper agreements are in place that adhere to EPA requirements	Total number of required new agreements initiated compared to total required to date	Chattanooga initiated negotiation of 7 out of 6 required IJA agreements pursuant to the program as of 2016
Gravity Line Preventive Maintenance Program	Approved by EPA and TDEC 12/3/2014	Section VI, Paragraph 20(d)	Annual Chemical Root Control Footage	To keep roots out of pipelines until a more permanent solution is in place	50,000 feet/year	94,808 feet were treated

**Table 2-1
CMOM Program Summary**

January 1, 2016 - December 31, 2016						
CMOM Program	CMOM Program Status	CD Reference	CMOM Program KPI	CMOM KPI Purpose	Established Performance Measure	Actual Measured Performance
Gravity Line Preventive Maintenance Program	Approved by EPA and TDEC 12/3/2014	Section VI, Paragraph 20(d)	Footage of Pipeline Hydraulically Cleaned During the Calendar Year	To stay on schedule to get all pipelines clean and keep them clean	1,000,000 feet/year	1,351,979 feet
Gravity Line Preventive Maintenance Program	Approved by EPA and TDEC 12/3/2014	Section VI, Paragraph 20(d)	Number of MACP Level 1 Manhole Inspections During the Calendar Year	To stay on schedule to get all Level 1 inspections complete	1,000/year until 2017 and then 2,000/year	1,904 inspections
Gravity Line Preventive Maintenance Program	Approved by EPA and TDEC 12/3/2014	Section VI, Paragraph 20(d)	Number of MACP Level 2 Manhole Inspections During the Calendar Year	To stay on schedule to get all Level 2 inspections complete	900/year until 2017 and then 1,200/year	501 inspections
Gravity Line Preventive Maintenance Program	Approved by EPA and TDEC 12/3/2014	Section VI, Paragraph 20(d)	The Number of SSOs caused by the build-up of debris, sediment, roots, and grease in the collection system	To measure the effectiveness of preventive maintenance at reducing SSOs	A reduction in maintenance-related SSOs	There were 27 SSOs associated with blockages

**Table 2-1
CMOM Program Summary**

January 1, 2016 - December 31, 2016						
CMOM Program	CMOM Program Status	CD Reference	CMOM Program KPI	CMOM KPI Purpose	Established Performance Measure	Actual Measured Performance
Gravity Line Preventive Maintenance Program	Approved by EPA and TDEC 12/3/2014	Section VI, Paragraph 20(d)	Footage of pipelines and frequency that preventive maintenance hydraulic cleaning is performed	To measure the effectiveness of preventive maintenance at reducing SSOs	Preventive Hydraulic Line Cleaning Frequency per the following: 2 months – 25,000 ft. 4 months – 50,000 ft. 6 months – 50,000 ft. 8 months – 50,000 ft. 12 months- 225,000 ft. 18 months- 250,000 ft. 36 months- 350,000 ft.	Preventive Hydraulic Cleaning for the Reporting Period (feet): Jan-45,287 Feb-111,289 Mar-121,705 April-103,885 May-114,690 June-75,387 July-145,889 Aug-134,595 Sept-108,393 Oct-145,024 Nov-134,324 Dec-111,511
Fats, Oils, and Grease (“FOG”) Management Program	Approved by EPA and TDEC 7/21/2015	Section VI, Paragraph 20(c)	Number of FOG-related SSOs	Measure FOG Program Success	Yearly Reduction in FOG-related SSOs	There were 6 SSOs associated with grease blockages.
Fats, Oils, and Grease (“FOG”) Management Program	Approved by EPA and TDEC 7/21/2015	Section VI, Paragraph 20(c)	Number of annual inspections vs the total number of Food Service Establishments (“FSEs”)	Measure FOG Program Workload	100%	80%

**Table 2-1
CMOM Program Summary**

January 1, 2016 - December 31, 2016						
CMOM Program	CMOM Program Status	CD Reference	CMOM Program KPI	CMOM KPI Purpose	Established Performance Measure	Actual Measured Performance
Fats, Oils, and Grease ("FOG") Management Program	Approved by EPA and TDEC 7/21/2015	Section VI, Paragraph 20(c)	Number of annual Noncompliance Notifications vs the total inspections	Evaluate the Effectiveness of Program Enforcement	Below 15%	3% of total inspections yielded a noncompliance notification
Fats, Oils, and Grease ("FOG") Management Program	Approved by EPA and TDEC 7/21/2015	Section VI, Paragraph 20(c)	FOG Hot Spots	Identify and Reduce the amount of sewer that is classified as a FOG hot spot area.	Reduce linear footage by 10%	12% reduction
Fats, Oils, and Grease ("FOG") Management Program	Approved by EPA and TDEC 7/21/2015	Section VI, Paragraph 20(c)	Number of FSEs Added Annually	Measure Program Progress	Have every existing FSE included in Program so only new ones are added	53 FSEs were added during the reporting period
Fats, Oils, and Grease ("FOG") Management Program	Approved by EPA and TDEC 7/21/2015	Section VI, Paragraph 20(c)	Annual FOG Management Program Update Completed on Time	Evaluate the effectiveness of FOG Program and identify new goals and KPIs	Complete Annually	Completed and submitted to the EPA a revised FOG plan on 9/28/2016
Fats, Oils, and Grease ("FOG") Management Program	Approved by EPA and TDEC 7/21/2015	Section VI, Paragraph 20(c)	Number of Pretreatment Program Employees Trained on FOG Management Program	Training	100%	100%

**Table 2-1
CMOM Program Summary**

January 1, 2016 - December 31, 2016						
CMOM Program	CMOM Program Status	CD Reference	CMOM Program KPI	CMOM KPI Purpose	Established Performance Measure	Actual Measured Performance
Pump Station Operations Program	Approved by EPA and TDEC 10/22/2015	Section VI, Paragraph 20(e)	Pump Station ("PS") Operational Checks	Ensure proper operation of PSs; determine if condition issues are present	95% adherence to PS/CSOTF visit schedule	100% completed on time
Pump Station Preventive Maintenance Program	Approved by EPA and TDEC 3/17/2015	Section VI, Paragraph 20(f)	Preventive Maintenance ("PM") Completion Schedule	Assure all PMs are being completed as scheduled	95% adherence to PM schedule	80% completed on time
Pump Station Preventive Maintenance Program	Approved by EPA and TDEC 3/17/2015	Section VI, Paragraph 20(f)	Number of Preventable Work Orders	Limit and track work orders that could have been preventable	Less than 5 preventable work orders per month	Average of 7 preventable work orders per month
Pump Station Preventive Maintenance Program	Approved by EPA and TDEC 3/17/2015	Section VI, Paragraph 20(f)	Track Work Orders Found Via PM Activities	Evaluate the success of the PM program	Track the number of PMs generated as a result of a PM	381 CMs generated from 1897 PMs (20%)
Pump Station Preventive Maintenance Program	Approved by EPA and TDEC 3/17/2015	Section VI, Paragraph 20(f)	Track the Age of Work Orders	Not let the work orders get lost in the process	No work orders older than 6 months	The average time to complete work orders was 13 days
Pump Station Preventive Maintenance Program	Approved by EPA and TDEC 3/17/2015	Section VI, Paragraph 20(f)	Percentage of Emergency Work Orders	Track the reliability of the City assets	Less than 10% of the work orders are emergencies	Emergency work orders were 0.37% or total work orders written
Pump Station Preventive Maintenance Program	Approved by EPA and TDEC 3/17/2015	Section VI, Paragraph 20(f)	Work Orders Awaiting Parts	Track the number of work orders incomplete due to materials and parts	No Work Orders Older than 30 days Awaiting Parts	110 requests with an average delivery time of 17.75 days

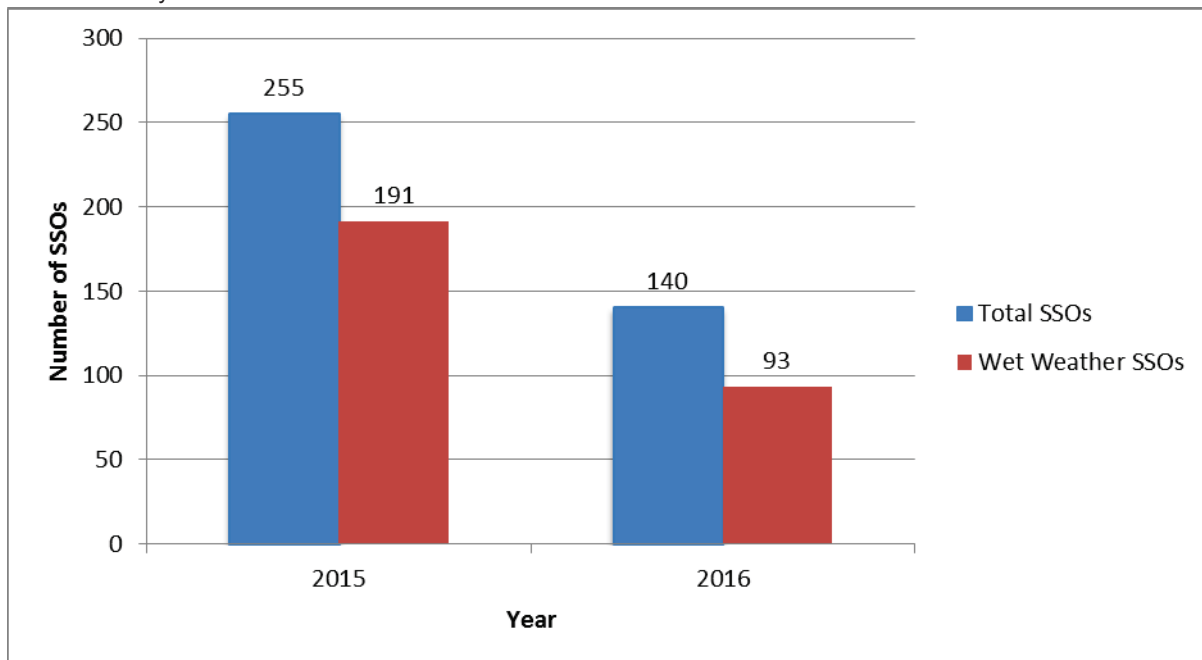
**Table 2-1
CMOM Program Summary**

January 1, 2016 - December 31, 2016						
CMOM Program	CMOM Program Status	CD Reference	CMOM Program KPI	CMOM KPI Purpose	Established Performance Measure	Actual Measured Performance
Pump Station Preventive Maintenance Program	Approved by EPA and TDEC 3/17/2015	Section VI, Paragraph 20(f)	Work Backlog	Measure Progress	Not more than 6 weeks of work	87% of work orders written were closed
Pump Station Preventive Maintenance Program	Approved by EPA and TDEC 3/17/2015	Section VI, Paragraph 20(f)	Track Work Orders by Failure Codes	Evaluate work by the types of failures experienced	15 categories of failure codes	Tracking all CMs by failure code
Pump Station Preventive Maintenance Program	Approved by EPA and TDEC 3/17/2015	Section VI, Paragraph 20(f)	Overtime as a Percent of Total Hours Worked	Evaluate the use and cost of labor	Less than 5%	Less than 5% OT
Capacity Assurance Program ("CAP")	Approved by EPA and TDEC 10/13/2016	Capacity Assurance Program ("CAP")	Applicable CD components to be identified during program implementation	N/A	N/A	N/A

3.0 SSO Trends Analysis

A trends analysis of the cause, duration, and volume of SSO events was conducted for the 24-month period spanning January 1, 2015 through December 31, 2016. Rainfall data collected during the same time period was included in the analysis to illustrate the effects of heavy, sustained rainfall on the occurrence, duration, and volume of the recorded SSO events. Figure 3-1 below provides a summary of SSO events by year for the reporting period:

Figure 3-1
SSO Events by Year



There was a downward trend in SSO events from 2015 to 2016 as illustrated in Figure 3-1. There was a similar downward trend in rainfall as described throughout this section and illustrated in Figure 3-2. The majority of SSO events during the reporting period were wet-weather related. There were 191 wet-weather related SSOs in 2015 and 93 wet-weather SSOs in 2016, which were 75% and 66% of the total SSOs in 2015 and 2016, respectively. This is a 9% overall reduction in wet-weather SSOs. As for SSOs that were not related to wet weather, there were 64 in 2015 and 47 in 2016, which was a decrease of 26%.

Based on data from rain gages installed throughout Chattanooga, the observed rainfall was 44% less in 2016 than 2015 and 32% lower than normal rainfall

There was one storm event in 2016 that had total rainfall beyond the 2-year 24-hour design storm event of 3.67 inches as defined in the Consent Decree. This event began on November 28, 2016 and had a rainfall total of 4.83 inches. There were 12 SSOs associated with this event. Figure 3-2 depicts SSO events by cause per month. Wet weather was the leading cause of

SSOs during the reporting period, followed by blockages. This chart also depicts the decreased monthly rainfall observed in 2016 versus 2015.

Figure 3-3 depicts total SSO events per month. The average number of SSOs per month for the reporting period was approximately 12, which is a 29% decrease from 2015. This average is significantly impacted by the above average number of SSOs reported in February, which correlates to a heavy rain event. After February 2016, SSOs did not seem to increase with heavy rain events and the average SSOs per month dropped to 6. This seems to indicate the implementation of the CMOM program under the Consent Decree, which is now in its fourth year, is having a positive effect.

Figure 3-4 depicts cumulative SSO duration per month or the sum of the durations of each SSO event that was recorded per month during the reporting period. The average cumulative SSO duration per month was approximately 212 hours, which is a 45% decrease from 2015. This average is also significantly inflated by the SSO duration in February. After February, the average cumulative duration per month is approximately 55 hours.

Figure 3-5 depicts cumulative SSO volume per month or the sum of the volumes of each SSO event that was recorded per month during the reporting period. The average cumulative SSO volume per month for the reporting period was found to be approximately 3 million gallons, which is a 92% decrease from 2015. Again this average is significantly increased by February's value and after February, the average dropped to 0.5 million gallons per month.

Figure 3-2
SSO Events by Cause

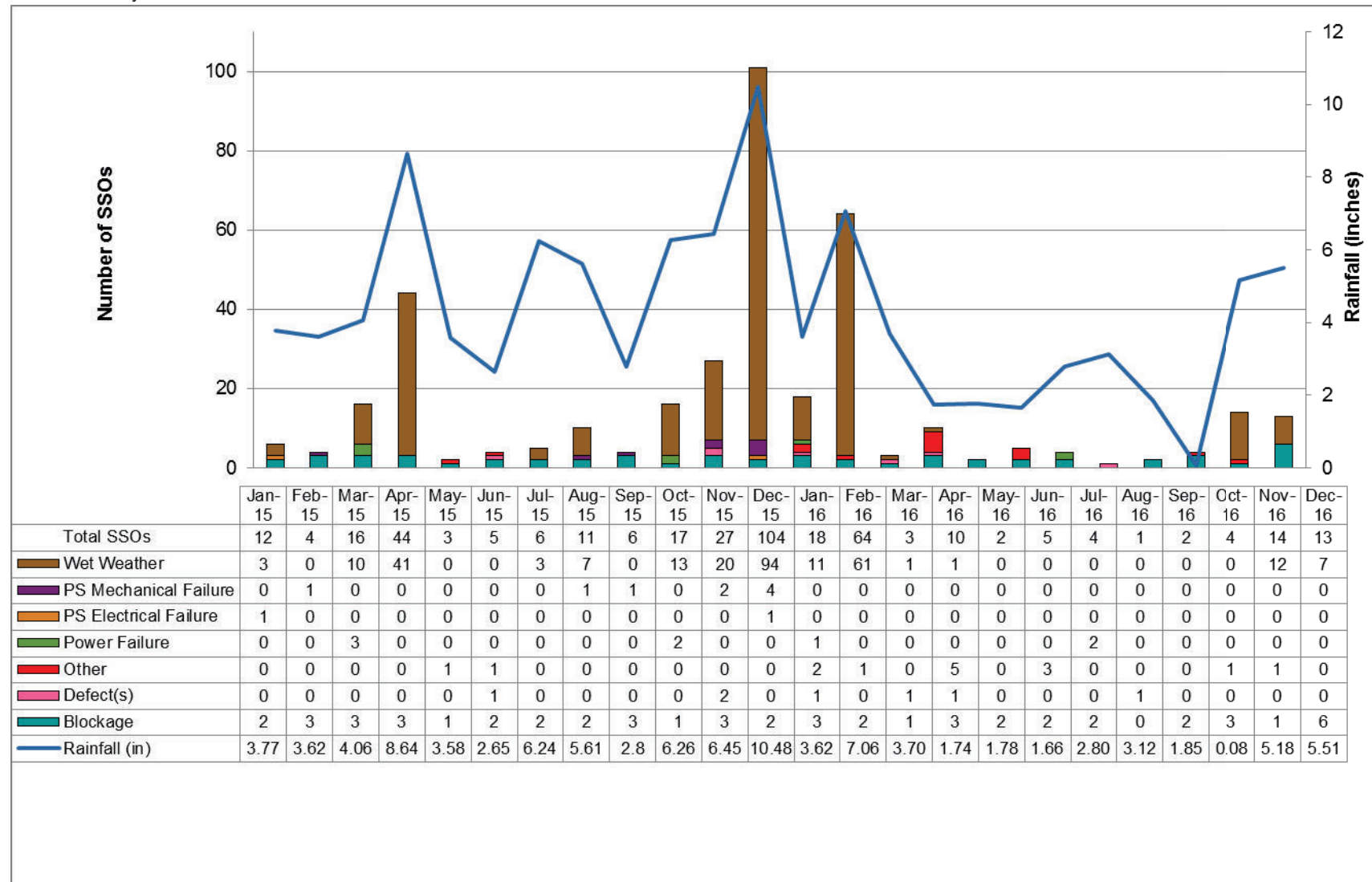


Figure 3-3
Monthly SSO Quantities

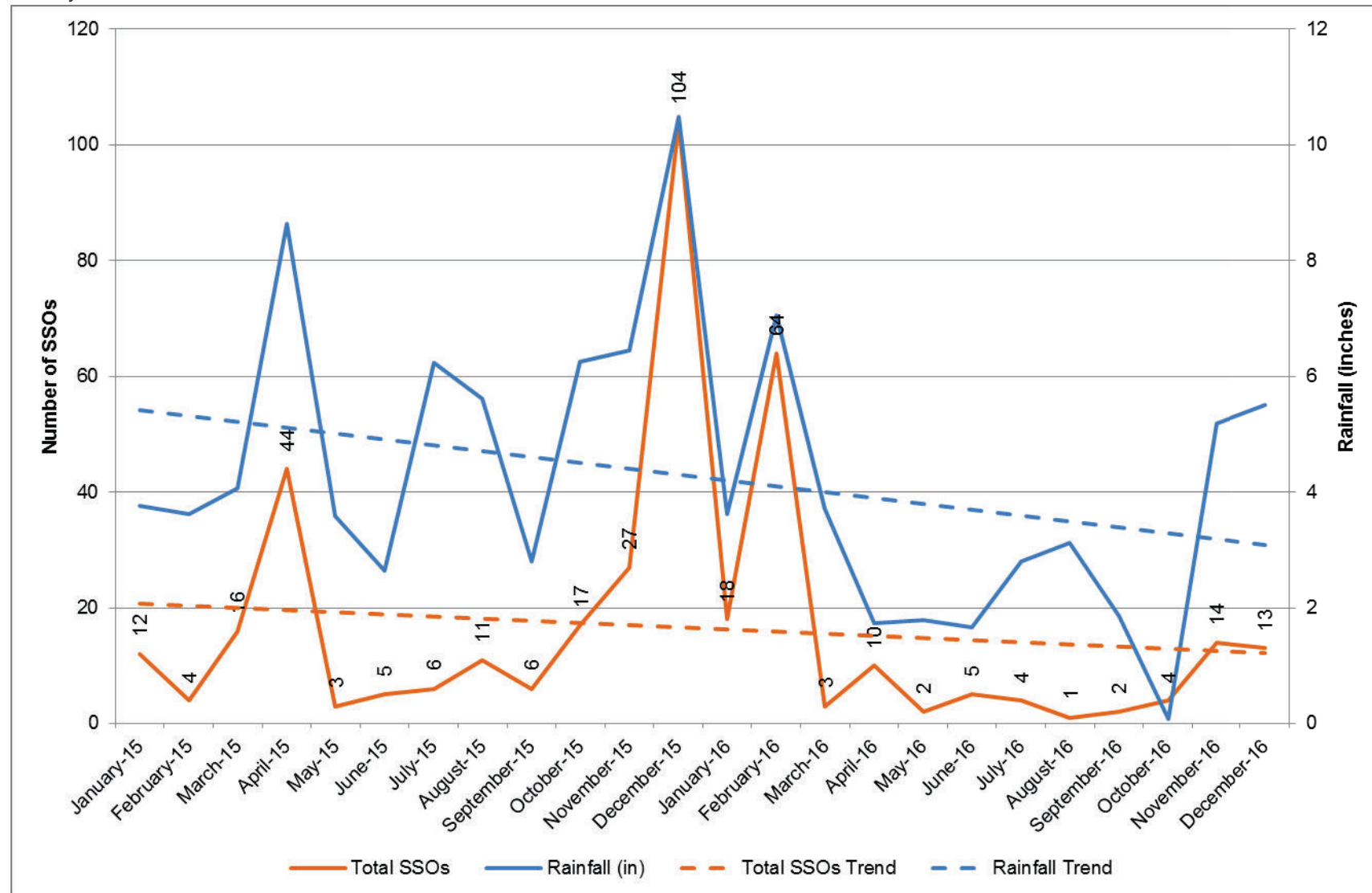


Figure 3-4
Monthly SSO Durations

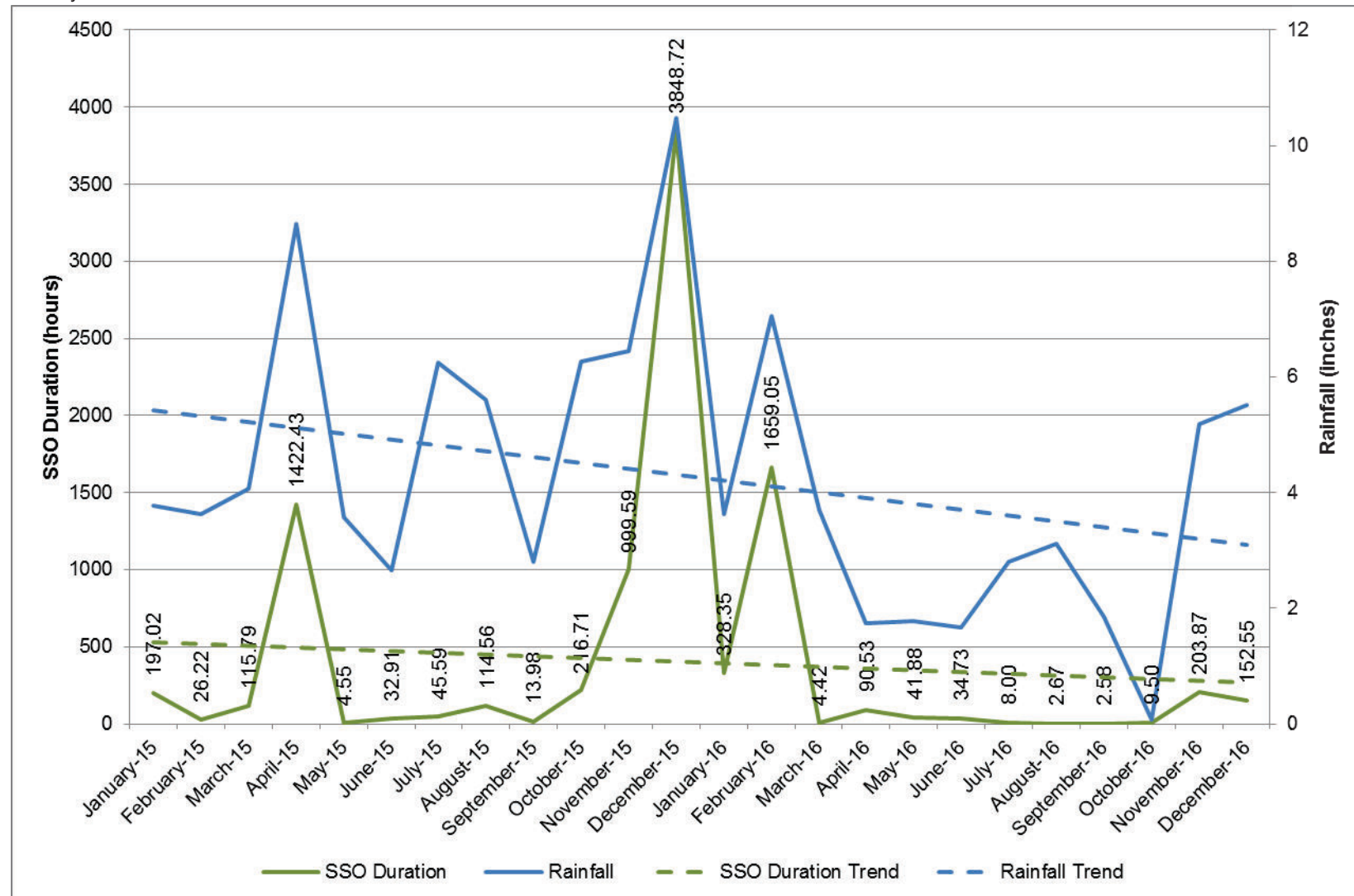
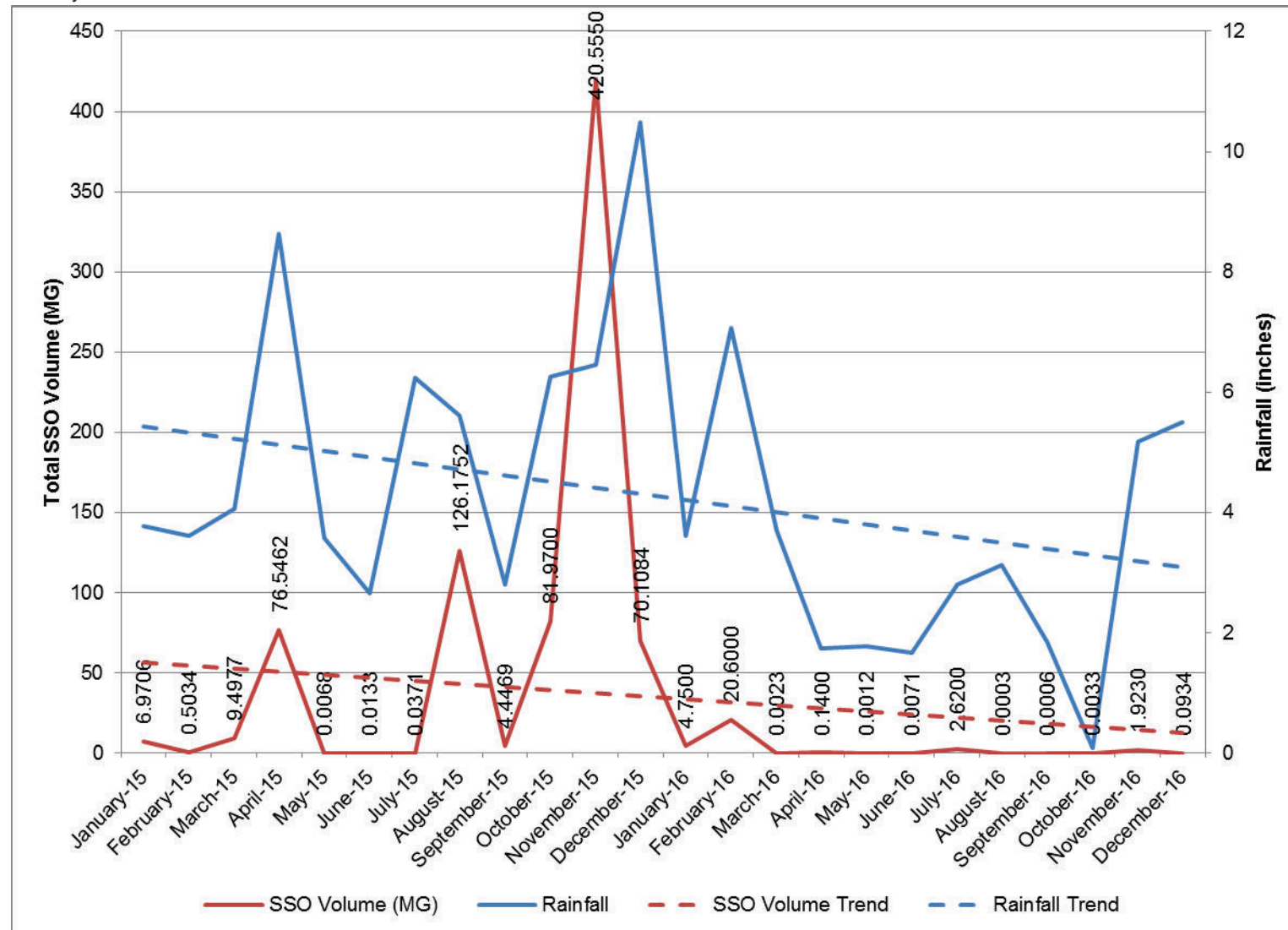


Figure 3-5
Monthly SSO Volumes



4.0 PCCMP Activities

4.1 Purpose

As detailed in Section 2.4.1.5 of the PCCMP, the Annual Report will also include the status of major PCCMP activities, as applicable, relating to the Chattanooga Creek CSOTFs

This project included developing a set of procedures and analysis from EPA guidance documents into the Long Term Control Plan-Post Construction Compliance Monitoring Program document. The purpose of this document is to determine a plan of operations for sampling and analyzing the Central Avenue and William Street CSO Outfalls to verify compliance of the discharges with State water quality standards (“WQS”) and protection of designated uses as well as to ascertain the effectiveness of CSO controls.

The full analysis of the data displayed in the following subsections will be included in the Additional Operational Plan (“AOP”). The AOP was to be submitted to TDEC originally on April 24, 2017 in accordance with the requirement of Section VI, Paragraph 24(a) of the CD. EPA has recently approved a six (6) month extension request for this document to allow the City to obtain additional creek samples needed to properly calibrate and validate the receiving water quality models. The AOP is now due in October 2017. The City is still collecting data in order to assess the impact of the CSO Outfall discharges on Chattanooga Creek. The data will be analyzed and trended in order to recommend possible additional CSO controls that may be needed to ensure the discharges comply with State WQS. Any data gaps or discrepancies shown below will be explained in detail in the AOP document.

4.2 Requirements

As detailed in Section 2.4.1.5 of the PCCMP, the City is required to report the status of the following major PCCMP activities, as applicable, relating to the Chattanooga Creek CSOTFs:

- CSOTF effluent and Chattanooga Creek monitoring data;
- Performance monitoring data;
- Outfall activation: number of discharge events, discharge volume as estimated from outfall flow data, and any relevant comments;
- Rainfall data: map of gauge locations and summary of results, including annual rainfall total depth, annual average intensity, annual average event duration, total number of events, event distribution by depth and the maximum event depth; and
- Flow monitoring: map of gauge sites and summary of results.

The information listed above is provided in the following subsections. Performance monitoring data, as detailed in the PCCMP, currently includes CSOTF effluent and Chattanooga Creek

monitoring data as well as outfall activation data. Thus, performance monitoring does not have its own separate data listed.

4.3 CSOTF Effluent and Chattanooga Creek

CSOTF Effluent and Chattanooga Creek data have been compiled by parameter and are shown by month in Table 4-1 through Table 4-46. The measured parameters include pH, dissolved oxygen ("DO"), Temperature, Conductivity, Biochemical Oxygen Demand ("BOD"), Settleable Solids, Total Suspended Solids ("TSS"), Ammonia-Nitrogen, Organic Nitrogen, Total Kjeldahl Nitrogen, Nitrate + Nitrite, Total Phosphorous, Dissolved Phosphorous, E.coli, Oil & Grease, and UV-Absorbing Constituents. There are a total of 2 CSOTF effluent locations and 6 Chattanooga Creek sample locations. Duplicates ("D") and Blanks ("B") samples were also taken at PCCMP-6 for applicable parameters for quality control purposes. Only DO and E. coli are listed in the CD as being not in compliance with State WQS. Additional parameters are being collected in order to better model DO, to determine plausibility for additional CSO controls, among other reasons.

Each of these parameters (with the exception of UV-Absorbing Constituents) was sampled at the six (6) Chattanooga Creek locations monthly during dry weather, which is defined as occurring after 72 hours of no measurable precipitation, and also during wet weather when there was not a discharge from either of the two CSOTFs. Each of these parameters was sampled at the six (6) Chattanooga Creek locations and also at the CSOTFs during a discharge event from either or both locations. Per the PCCMP, only three wet weather samples after a release from one or both of the CSOTFs were required in the initial 12 month period of sampling. Due to extreme dry weather conditions, the City was unable to collect all discharge samples needed during the monitoring period to successfully calibrate and validate the receiving water quality models and has received approval for a six (6) month extension for additional sampling.

4.3.1 pH

PH values for dry weather, wet weather, and wet weather during CSOTF discharge are shown in Tables 4-1, 4-2, and 4-3, respectively.

Table 4-1
pH Values by Month for Dry Weather

Site	Oct-15	Nov-15	Jan-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16
PCCMP-1	7.1	7.2	7.2	7.2	7.4	7.4	7.7	7.5	7.3	7.5	7.6
PCCMP-2	7.3	7.3	7.2	7.3	7.5	7.4	7.6	7.4	7.3	7.6	7.2
PCCMP-3	7	7.4	7.3	7.4	7.4	7.4	7.5	7.3	7.4	7.6	7.3
PCCMP-4	7.2	7.4	7.3	7.9	7.8	7.5	7.6	7.5	7.4	7.5	7.2
PCCMP-5	7.2	7.4	7.9	7.4	7.7	7.6	7.6	7.4	7.4	7.4	7.4
PCCMP-6	7.2	7.3	7.3	8	7.7	7.5	7.5	7.4	7.5	7.3	7.6

Table 4-2

pH Values by Month for Wet Weather

Site	Oct-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	Jun-16	Jul-16	Aug-16	Sep-16	Nov-16
PCCMP-1	7.5	7.1	7.4	7.3	7.7	7.4	7.7	7.4	7.3	7.3	7.6
PCCMP-2	7.4	7.3	7.4	7.3	7.4	7.5	7.5	7.4	7.6	7.3	7.6
PCCMP-3	7.4	7.2	7.4	7.3	7.5	7.4	7.5	7.4	7.5	7.4	7.6
PCCMP-4	7.3	7.7	7.5	7.8	7.6	7.7	7.6	7.5	7.4	7.3	7.2
PCCMP-5	7.4	7.7	7.9	7.7	7.5	7.7	7.5	7.5	7.4	7.3	7.4
PCCMP-6	7.4	7.4	8	8	7.6	7.6	7.6	7.5	7.3	7.3	8.2

Table 4-3

pH Values by Month for Wet Weather during CSOTF Discharge

Site	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Nov-16	Dec-16
PCCMP-1	7.4	7	7.2	7.2	7.3	7.3	7.2
PCCMP-2	8.4	7	7.6	7.3	7.3	7.3	7.7
PCCMP-3	7.6	7	7.2	7.2	7.4	7.3	7.7
PCCMP-4	7.1	6.8	7.6	7.8	7.3	7.3	-
PCCMP-5	7.5	7.6	7.6	7.8	7.8	7.4	-
PCCMP-6	7.2	7.2	7.7	8	7.9	7.8	-
CSOTF 002	7.2	7	-	7.3	7.2	7.1	7.3
CSOTF 003	-	-	7		7.2	7.1	-

4.3.2 DO

DO values for dry weather, wet weather, and wet weather during CSOTF discharge are shown in Tables 4-4, 4-5, and 4-6, respectively.

Table 4-4

DO Values by Month for Dry Weather

Site	Oct-15	Nov-15	Jan-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16
PCCMP-1	8.31	10.4	10.3	10.6	8.57	7.36	7.39	4.96	4.98	6.38	7.46	7.65
PCCMP-2	8.02	9.96	11	10.4	8.15	6.76	6.33	5.16	3.75	5.45	4.67	6.74
PCCMP-3	7.38	9.75	10.9	10.4	7.91	6.32	5.15	3.92	2.83	5.21	5.54	6.6
PCCMP-4	7.4	9.57	10.8	10.5	7.93	6.04	4.18	3.9	2.08	3.57	4	6.73
PCCMP-5	6.88	9.07	10.8	10.4	7.85	5.93	3.81	2.39	2.75	2.74	7.75	6.56
PCCMP-6	7.11	8.64	11.2	10.4	7.97	5.91	3.19	2.07	4.06	2.39	5.43	6.59

Table 4-5

DO Values by Month for Wet Weather

Site	Oct-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	Jun-16	Jul-16	Aug-16	Sep-16
PCCMP-1	7.73	9.02	11.6	8.98	7.85	8.98	5.99	4.75	4.56	4.46
PCCMP-2	7.08	7.72	11.6	8.7	7.71	8.7	4.85	3.95	4.37	3.94
PCCMP-3	7.16	7.71	11.8	8.54	7.6	8.54	4.82	3.87	3.82	4.46

Site	Oct-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	Jun-16	Jul-16	Aug-16	Sep-16
PCCMP-4	6.92	7.71	11.9	8.36	7.49	8.36	4.35	3.42	3.12	3.84
PCCMP-5	6.86	7.63	11.9	8.48	7.45	8.48	3.67	2.67	2.51	3.11
PCCMP-6	6.79	7.54	12	8.35	7.48	8.35	4.44	2.51	2.3	3.95

Table 4-6

DO Values by Month for Wet Weather during CSOTF Discharge

Site	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Nov-16	Dec-16
PCCMP-1	6.09	8.29	7.07	11.2	8.57	6.97	8.63
PCCMP-2	7.57	7.32	7.33	11.1	8.98	7.95	8.55
PCCMP-3	7.41	7.29	7.69	10.8	8.71	7.86	8
PCCMP-4	7.9	7.49	7.54	11	8.83	7.76	-
PCCMP-5	7.71	7.49	7.43	11	8.72	7.54	-
PCCMP-6	7.67	7.42	7.52	11	8.64	7.19	-
CSOTF 002	6.46	4.15	-	4.03	8.54	8.16	7.99
CSOTF 003	-	-	8.22	-	9.71	7.62	-

4.3.3 Temperature

Temperature values in Celsius for dry weather, wet weather, and wet weather during CSOTF discharge are shown in Tables 4-7, 4-8, and 4-9, respectively.

Table 4-7

Temperature Values by Month for Dry Weather

Site	Oct-15	Nov-15	Jan-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16
PCCMP-1	16	8.3	5.1	9.2	14.2	18.7	20.3	27	26.2	23.3	18.1
PCCMP-2	15.9	9.5	5.1	9.9	14.7	19.1	21.1	26.9	26.3	23.3	18.1
PCCMP-3	17	10	5.1	10.4	15.7	19.2	22.3	27.2	26.3	23.6	18.6
PCCMP-4	18.1	10.5	5.3	10.9	16.2	19.7	23.1	27	26.3	24.7	19.3
PCCMP-5	18	10.8	5	11.5	16.2	20.3	22.8	27.2	26.8	24.6	19.9
PCCMP-6	18.5	10.8	5	11.8	16.7	20.5	23.1	27.7	27.9	24.8	20.9

Table 4-8

Temperature Values by Month for Wet Weather

Site	Oct-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	Jun-16	Jul-16	Aug-16	Sep-16	Nov-16
PCCMP-1	15.8	12.5	5.3	5.2	16.7	13.1	23.8	25.2	26	23.9	11.2
PCCMP-2	15.9	12.6	4.9	4.8	16.7	13.4	23.8	25.2	25.8	24.1	11.8
PCCMP-3	16	13	4.9	4.9	16.5	13.6	24.9	25.4	26.7	24.9	12.5
PCCMP-4	16	13.7	4.8	5.3	16.7	14.3	25.1	25.8	26.7	25.3	13.7
PCCMP-5	16	14	4.9	5.1	16.8	13.7	25.2	26.2	27.1	25.1	14.2
PCCMP-6	15.9	13.8	4.9	5.1	16.7	14.4	26.9	25.7	27.8	25.4	14.8

Table 4-9

Temperature Values by Month for Wet Weather during CSOTF Discharge

Site	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Nov-16	Dec-16
PCCMP-1	19.4	14	14.7	7.8	15	16.4	8.7
PCCMP-2	17.7	14.9	14.5	7	14.8	17.1	9.5
PCCMP-3	18.4	15.1	14.5	7.7	15	19.8	6.6
PCCMP-4	18.1	15.5	14.4	7.2	14.8	17.1	-
PCCMP-5	18.4	15	14.4	7.3	14.9	17.3	-
PCCMP-6	18.3	15.1	14.3	7.6	15.2	17.4	-
CSOTF 002	4.7	17.3	-	8.9	15.3	17.3	10.2
CSOTF 003	-	-	15.4	-	14.6	17.1	-

4.3.4 Conductivity

Conductivity in $\mu\text{mhos/cm}$ for dry weather, wet weather, and wet weather during CSOTF discharge are shown in Tables 4-10, 4-11, and 4-12, respectively.

Table 4-10

Conductivity Values by Month for Dry Weather

Site	Oct-15	Nov-15	Jan-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16
PCCMP-1	182	177	157	155	162	192	239	243	193	268	230	227
PCCMP-2	184	195	183	184	177	217	253	287	225	323	303	225
PCCMP-3	214	199	180	171	181	220	265	303	238	313	286	212
PCCMP-4	216	201	185	174	185	222	261	309	242	317	295	169
PCCMP-5	216	202	187	174	185	225	259	308	232	322	282	141
PCCMP-6	209	201	186	173	180	229	247	291	208	321	223	116
PCCMP-6-D	210	201	189	1.1	1.1	1	1.3	1.2	1.5	1.4	222	113
PCCMP-6-B	1.1	1.2	1.3	174	180	231	250	291	202	320	1.2	1.8

Table 4-11

Conductivity Values by Month for Wet Weather

Site	Oct-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	Jun-16	Jul-16	Aug-16	Sep-16
PCCMP-1	229	176	156	163	150	170	242	238	224	198
PCCMP-2	210	181	178	192	152	175	272	249	236	246
PCCMP-3	205	183	178	184	151	170	276	272	238	243
PCCMP-4	203	187	174	193	153	176	282	260	253	238
PCCMP-5	203	192	174	187	153	169	280	256	271	218
PCCMP-6	210	218	172	184	153	165	275	284	266	108
PCCMP-6-D	211	221	173	186	1.1	1.1	1.2	1.1	1.3	1.1
PCCMP-6-B	1.8	1.2	1	1.2	154	164	278	289	260	

Table 4-12

Conductivity Values by Month for Wet Weather during CSOTF Discharge

Site	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Nov-16
PCCMP-1	216	112	153	134	108	128
PCCMP-2	101	146	127	145	136	114
PCCMP-3	129	127	130	144	123	113
PCCMP-4	120	128	129	144	122	113
PCCMP-5	117	129	130	145	121	120
PCCMP-6	106	131	130	146	123	118
PCCMP-6-D	111	131	131	146	123	114
PCCMP-6-B	1.5	1.3	1.8	1.2	1.1	3.9
CSOTF 002	174	131	-	334	200	112
CSOTF 003	-	-	236	-	128	67.4

4.3.5 BOD

BOD in mg/L for dry weather, wet weather, and wet weather during CSOTF discharge are shown in Tables 4-13, 4-14, and 4-15, respectively.

Table 4-13

BOD Values by Month for Dry Weather

Site	Oct-15	Nov-15	Jan-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16
PCCMP-1	2.8	2.4	2.1	2.4	2.4	2.4	1.7	2.3	2.1	2.1	2.1
PCCMP-2	2.8	2.4	2.1	2.4	2.4	2.4	1.7	2.3	2.1	2.8	2.1
PCCMP-3	2.8	2.4	2.1	2.4	2.4	2.4	1.7	2.3	2.1	2.1	2.1
PCCMP-4	2.8	2.4	2.1	2.4	2.4	2.4	1.7	2.3	2.1	2.1	2.1
PCCMP-5	2.8	2.4	2.1	2.4	2.4	2.4	1.7	2.3	2.1	2.1	2.9
PCCMP-6	2.8	2.4	2.1	2.4	2.4	2.4	1.7	2.3	2.1	2.1	2.1
PCCMP-6-D	2.8	2.4	2.1	2.4	2.4	2.4	1.7	2.3	2.1	2.1	2.1
PCCMP-6-B	1.9	2.4	5.3	2.4	2.4	2.4	1.7	2.3	2.1	2.1	2.1

Table 4-14

BOD Values by Month for Wet Weather

Site	Oct-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	Jun-16	Jul-16	Aug-16	Sep-16	Nov-16
PCCMP-1	3	2.3	2.4	2.4	2.3	2.7	2.3	2.3	2	1.9	4.7
PCCMP-2	3	2.3	5.6	2.4	2.5	2.7	2.3	2.3	2	1.9	5
PCCMP-3	3	2.3	2.1	2.4	3.9	2.7	2.3	2.5	2.5	2	7
PCCMP-4	3	2.3	2.1	2.4	3.9	2.7	2.3	2.3	3.8	2	11.2
PCCMP-5	3	2.3	2.1	2.4	4.4	2.7	2.3	2.3	2.3	2.1	12.8
PCCMP-6	3	2.3	2.4	2.4	4.9	2.7	2.3	2.3	2	3.5	14.8
PCCMP-6-D	3	2.3	3.2	2.4	2.3	2.7	2.3	2.3	2	1.9	14.4
PCCMP-6-B	3	2.3	2.1	2.4	5.4	2.7	2.3	2.3	2	108	2.4

Table 4-15

BOD Values by Month for Wet Weather during CSOTF Discharge

Site	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Nov-16
PCCMP-1	2.8	5.3	3.2	2.1	2.8	4.5
PCCMP-2	6.2	5.3	3.2	2.1	2.8	4.2
PCCMP-3	220	5.3	3.5	2.1	2.8	5.8
PCCMP-4	7.5	5.3	3.3	2.1	2.8	5.3
PCCMP-5	7.9	5.3	3.8	2.1	2.8	6.5
PCCMP-6	5.8	5.3	3.5	2.1	2.8	6.3
PCCMP-6-D	8.6	5.3	4	2.1	3.2	6
PCCMP-6-B	1.9	5.3	3.2	2.1	2.8	2.4
CSOTF 002	58	71	-	2.1	36	14
CSOTF 003	-	-	30.5	-	12.7	6.2

4.3.6 Settleable Solids

Settleable solids in mg/L for dry weather, wet weather, and wet weather during CSOTF discharge are shown in Tables 4-16, 4-17, and 4-18, respectively.

Table 4-16

Settleable Solids Values by Month for Dry Weather

Site	Oct-15	Nov-15	Jan-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16
PCCMP-1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
PCCMP-2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
PCCMP-3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
PCCMP-4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
PCCMP-5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
PCCMP-6	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
PCCMP-6-D	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
PCCMP-6-B	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Table 4-17

Settleable Solids Values by Month for Wet Weather

Site	Oct-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	Jun-16	Jul-16	Aug-16	Sep-16	Nov-16
PCCMP-1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
PCCMP-2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
PCCMP-3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
PCCMP-4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
PCCMP-5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
PCCMP-6	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
PCCMP-6-D	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
PCCMP-6-B	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	3.3	0.1

Table 4-18

Settleable Solids Values by Month for Wet Weather during CSOTF Discharge

Site	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Nov-16
PCCMP-1	0.1	0.1	0.1	0.1	0.1	0.1
PCCMP-2	0.1	0.1	0.1	0.1	0.1	0.1
PCCMP-3	0.1	0.1	0.1	0.1	0.1	0.1
PCCMP-4	0.1	0.1	0.1	0.1	0.1	0.1
PCCMP-5	0.1	0.1	0.1	0.1	0.1	0.1
PCCMP-6	0.1	0.1	0.1	0.1	0.1	0.1
PCCMP-6-D	0.1	0.1	0.1	0.1	0.1	0.1
PCCMP-6-B	0.1	0.1	0.1	0.1	0.1	0.1
CSOTF 002	0.1	0.1	-	0.1	0.1	0.1
CSOTF 003	-	-	0.2	-	0.1	0.1

4.3.7 TSS

TSS in mg/L for dry weather, wet weather, and wet weather during CSOTF discharge are shown in Tables 4-19, 4-20, and 4-21, respectively.

Table 4-19

TSS Values by Month for Dry Weather

Site	Oct-15	Nov-15	Jan-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16
PCCMP-1	7	4.4	2.4	4.4	7.6	8.8	8.4	4	4.4	12	1.4
PCCMP-2	7.6	4	4	5.2	6	12	8.4	4	8	6.4	4.4
PCCMP-3	6.2	4.4	2	6.4	6.4	7.2	5.6	4.8	6.8	6	3.2
PCCMP-4	7.4	2.8	3.6	6	6.4	6.4	4	4	2.8	10.4	3.6
PCCMP-5	4.6	2.4	3.2	4	5.6	4	2.4	1.4	3.6	3.2	5
PCCMP-6	3.2	2.4	3.2	3.6	4.8	2.8	1.6	1.4	3.6	4	1.6
PCCMP-6-D	3.6	2.8	7.5	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
PCCMP-6-B	1.4	1.4	1.4	4.8	4.8	4	2	2	3.2	3.6	1.4

Table 4-20

TSS Values by Month for Wet Weather

Site	Oct-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	Jun-16	Jul-16	Aug-16	Sep-16	Nov-16
PCCMP-1	9.6	4.8	76	3.6	22	10.8	9.2	6.3	8.4	9.2	31
PCCMP-2	11.2	8	54	2.4	24.8	16.8	7.2	4.4	8	5.2	8.5
PCCMP-3	12.4	5.2	52	2	21.6	15.2	8.4	5.6	10.4	7.2	11.5
PCCMP-4	10.8	4.4	52	4	18.8	13.2	6.8	4	8	9.6	27.3
PCCMP-5	9.6	4.8	56	3.2	20	11.2	2.4	2	6.8	10.8	25.3
PCCMP-6	8	4.8	90	2.8	17.2	12.4	3.2	2.5	3.6	21.6	43.1
PCCMP-6-D	7.6	5.2	67	2.8	1.4	1.4	1.4	1.4	1.4	1.4	41.5
PCCMP-6-B	1.4	1.4	1.4	1.4	16.8	12.4	2.4	2	1.6	0.1	1.4

Table 4-21

TSS Values by Month for Wet Weather during CSOTF Discharge

Site	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Nov-16
PCCMP-1	11.6	51.9	11.2	16.4	35.3	33.1
PCCMP-2	53.6	30.6	16	12	42	30
PCCMP-3	58.6	33.6	29.5	12	55	26
PCCMP-4	35	31	29.3	12.4	64	22
PCCMP-5	87	34	28	10.8	62	26
PCCMP-6	38	44	30	8.8	64	28
PCCMP-6-D	39	31	44	10.8	63	31.3
PCCMP-6-B	1.4	1.4	1.4	1.4	1.4	1.4
CSOTF 002	70	66	-	75	49	20.8
CSOTF 003	-	-	138	-	28	6.5

4.3.8 Ammonia-Nitrogen

Ammonia-Nitrogen in mg/L for dry weather, wet weather, and wet weather during CSOTF discharge are shown in Tables 4-22, 4-23, and 4-24, respectively.

Table 4-22

Ammonia-Nitrogen Values by Month for Dry Weather

Site	Oct-15	Nov-15	Jan-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16
PCCMP-1	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.7	0.1	0.4
PCCMP-2	0.3	0.3	0.3	0.1	0.1	0.2	0.1	0.1	0.3	0.1	0.4
PCCMP-3	1.7	0.3	0.3	0.1	0.1	0.2	0.1	0.1	0.6	0.1	0.3
PCCMP-4	1.5	0.3	0.3	0.1	0.1	0.2	0.1	0.1	0.4	0.1	0.3
PCCMP-5	0.3	0.3	0.3	0.1	0.2	0.1	0.1	0.1	0.3	0.1	0.6
PCCMP-6	0.9	0.3	0.3	0.1	0.1	0.2	0.1	0.1	0.6	0.1	0.6
PCCMP-6-D	0.6	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4
PCCMP-6-B	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.6	0.1	0.2

Table 4-23

Ammonia-Nitrogen Values by Month for Wet Weather

Site	Oct-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	Jun-16	Jul-16	Aug-16	Sep-16	Nov-16
PCCMP-1	0.3	0.3	0.6	0.1	0.1	0.1	0.8	0.1	0.3	0.1	0.3
PCCMP-2	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.1	0.2
PCCMP-3	0.3	0.3	0.1	0.1	0.1	0.1	0.2	0.1	0.4	0.1	0.2
PCCMP-4	0.3	0.3	0.1	0.1	0.1	0.1	0.3	0.1	0.4	0.1	0.3
PCCMP-5	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.6	0.1	0.4
PCCMP-6	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.1	0.3
PCCMP-6-D	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3
PCCMP-6-B	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.4	18.8	0.1

Table 4-24

Ammonia-Nitrogen Nitrogen Values by Month for Wet Weather during CSOTF Discharge

Site	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Nov-16
PCCMP-1	0.3	0.5	0.3	0.1	-	0.2
PCCMP-2	0.3	0.5	0.3	0.1	0.1	0.2
PCCMP-3	0.3	0.6	0.5	0.1	0.1	0.3
PCCMP-4	0.5	0.6	0.3	0.1	-	0.3
PCCMP-5	0.7	0.3	0.3	0.1	0.1	0.2
PCCMP-6	0.7	0.5	0.3	0.1	0.1	0.2
PCCMP-6-D	0.6	0.5	0.3	0.1	0.1	0.2
PCCMP-6-B	0.3	0.5	0.3	0.1	0.1	0.1
CSOTF 002	1.6	1.6	-	3.3	1.7	0.6
CSOTF 003	-	-	0.3	-	0.1	0.3

4.3.9 Organic Nitrogen

Organic Nitrogen in mg/L for dry weather, wet weather, and wet weather during CSOTF discharge are shown in Tables 4-25, 4-26, and 4-27, respectively.

Table 4-25

Organic Nitrogen Values by Month for Dry Weather

Site	Oct-15	Nov-15	Jan-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16
PCCMP-1	0.6	0.6	0.5	0.2	0.9	0.7	0.2	0.2	0.4	0.6	0.3
PCCMP-2	0.5	0.4	0.6	0.2	0.9	0.8	0.2	0.4	0.8	0.5	0.2
PCCMP-3	0.6	0.4	0.5	0.2	1	1	0.5	0.6	0.4	0.5	0.5
PCCMP-4	0.7	0.7	0.6	0.2	1	1	0.5	0.8	0.7	0.6	0.5
PCCMP-5	0.6	0.6	0.5	0.2	0.8	1	0.2	0.4	0.7	0.7	0.5
PCCMP-6	0.6	0.6	0.5	0.2	0.3	1.1	0.2	0.2	0.2	0.6	0.4
PCCMP-6-D	0.6	0.7	0.6	0.2	0.5	1	0.2	0.5	0.2	0.6	0.3
PCCMP-6-B	0.6	0.3	0.3	0.2	0.3	0.5	0.2	0.5	0.2	0.2	0.4

Table 4-26

Organic Nitrogen Values by Month for Wet Weather

Site	Oct-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	Jun-16	Jul-16	Aug-16	Sep-16	Nov-16
PCCMP-1	0.6	0.3	1.1	0.2	0.3	0.7	0.4	0.2	0.8	0.6	0.7
PCCMP-2	0.6	0.6	0.8	0.2	0.7	0.8	0.6	0.2	1	0.6	0.7
PCCMP-3	0.6	0.5	2.5	0.2	0.7	0.7	0.9	0.2	0.9	0.9	0.9
PCCMP-4	0.6	0.3	0.2	0.2	0.5	0.8	0.3	0.2	1.1	0.6	1
PCCMP-5	0.6	0.4	0.2	0.2	0.9	0.7	0.4	0.2	0.9	0.9	0.7
PCCMP-6	0.6	0.3	0.8	0.2	0.5	1.6	0.4	0.2	0.9	0.9	1.1
PCCMP-6-D	0.4	0.4	1	0.2	0.5	1.2	0.4	0.3	0.9	1	1
PCCMP-6-B	0.3	0.3	0.2	0.2	0.3	1	0.2	0.3	0.8	0.5	0.2

Table 4-27

Organic Nitrogen Values by Month for Wet Weather during CSOTF Discharge

Site	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Nov-16
PCCMP-1	0.3	1	0.8	1.1	-	0.8
PCCMP-2	0.3	0.9	0.8	0.2	0.2	1.4
PCCMP-3	0.3	1	1	0.2	0.2	1
PCCMP-4	0.3	1	1	0.2	-	1.1
PCCMP-5	0.3	1.1	0.9	0.2	0.2	1.1
PCCMP-6	0.3	1	0.9	0.2	0.2	1.2
PCCMP-6-D	0.3	0.8	0.9	0.2	0.2	1.2
PCCMP-6-B	0.3	0.3	0.3	0.2	0.2	0.2
CSOTF 002	1.4	10.5	-	11.4	4.3	2
CSOTF 003	-	-	1.1	-	0.2	1.1

4.3.10 Total Kjeldahl Nitrogen

Total Kjeldahl Nitrogen in mg/L for dry weather, wet weather, and wet weather during CSOTF discharge are shown in Tables 4-28, 4-29, and 4-30, respectively.

Table 4-28

Total Kjeldahl Nitrogen Values by Month for Dry Weather

Site	Oct-15	Nov-15	Jan-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16
PCCMP-1	0.9	0.9	0.8	0.3	1	0.8	0.3	0.3	1.1	0.7	0.7
PCCMP-2	0.8	0.7	0.9	0.3	1	1	0.3	0.5	1.1	0.6	0.6
PCCMP-3	2.3	0.7	0.8	0.3	1.1	1.1	0.6	0.7	1	0.6	0.8
PCCMP-4	2.2	1	0.9	0.3	1.1	1.1	0.6	0.9	1.1	0.7	0.8
PCCMP-5	0.9	0.9	0.8	0.3	1	1.1	0.3	0.5	1	0.8	1.1
PCCMP-6	1.5	0.9	0.8	0.3	0.4	1.3	0.3	0.3	0.6	0.7	0.8
PCCMP-6-D	1.2	1	0.9	0.3	0.6	1.1	0.3	-	0.6	0.7	0.9
PCCMP-6-B	0.9	0.6	0.6	0.3	0.4	0.6	0.3	-	0.3	0.3	0.6

Table 4-29

Total Kjeldahl Nitrogen Values by Month for Wet Weather

Site	Oct-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	Jun-16	Jul-16	Aug-16	Sep-16	Nov-16
PCCMP-1	0.9	0.6	1.7	0.3	0.4	0.8	1.2	0.3	1.1	0.7	1
PCCMP-2	0.9	0.9	0.9	0.3	0.8	1	0.7	0.3	1.3	0.7	0.9
PCCMP-3	0.9	0.8	2.6	0.3	0.8	0.8	1	0.3	1.3	1	1.1
PCCMP-4	0.9	0.6	0.3	0.3	0.6	1	0.7	0.3	1.5	0.7	1.3
PCCMP-5	0.9	0.7	0.3	0.3	1	0.8	0.5	0.3	1.5	1	1.1
PCCMP-6	0.9	0.6	0.9	0.3	0.6	1.7	0.5	0.3	1.3	1	1.4
PCCMP-6-D	0.7	0.7	1.1	0.3	0.6	1.3	0.5	-	1.3	1.1	1.3
PCCMP-6-B	0.6	0.6	0.3	0.3	0.4	1.1	0.3	-	0.9	0.6	0.3

Table 4-30

Total Kjeldahl Nitrogen Values by Month for Wet Weather during CSOTF Discharge

Site	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Nov-16
PCCMP-1	0.6	1.5	1.1	1.1	0.3	1
PCCMP-2	0.6	1.4	1.1	0.3	0.3	1.6
PCCMP-3	0.6	1.5	1.5	0.3	0.3	1.3
PCCMP-4	0.8	1.6	1.3	0.3	0.3	1.4
PCCMP-5	1	1.4	1.2	0.3	0.3	1.3
PCCMP-6	1	1.5	1.2	0.3	0.3	1.4
PCCMP-6-D	0.9	1.3	1.2	0.3	0.3	1.4
PCCMP-6-B	0.6	0.8	0.6	0.3	0.3	0.3
CSOTF 002	3	12	-	14.8	6	2.6
CSOTF 003	-	-	1.4	-	0.3	1.4

4.3.11 Nitrate + Nitrite

Nitrate+ Nitrite in mg/L for dry weather, wet weather, and wet weather during CSOTF discharge are shown in Tables 4-31, 4-32, and 4-33, respectively.

Table 4-31

Nitrate + Nitrite Values by Month for Dry Weather

Site	Oct-15	Nov-15	Jan-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16
PCCMP-1	0.11	0.15	0.22	0.21	0.162	0.22	0.181	0.132	0.252	0.132	0.06
PCCMP-2	0.12	0.1	0.25	0.3	0.191	0.301	0.209	0.177	0.228	0.18	0.274
PCCMP-3	0.1	0.15	0.28	0.42	0.228	0.28	0.225	0.19	0.194	0.135	0.157
PCCMP-4	0.14	0.13	0.35	0.28	0.198	0.251	0.23	0.132	0.155	0.132	0.186
PCCMP-5	0.15	0.1	0.3	0.27	0.216	0.27	0.273	0.132	0.182	0.14	0.228
PCCMP-6	0.16	0.11	0.2	0.24	0.203	0.399	0.29	0.132	0.148	0.152	0.242
PCCMP-6-D	0.17	0.13	0.17	0.23	0.194	0.277	0.294	-	0.153	0.134	0.241
PCCMP-6-B	0.05	0.05	0.05	0.05	0.132	0.132	0.132	-	0.132	0.132	0.06

Table 4-32

Nitrate + Nitrite Nitrogen Values by Month for Wet Weather

Site	Oct-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	Jun-16	Jul-16	Aug-16	Sep-16	Nov-16
PCCMP-1	0.09	0.19	0.23	0.27	0.12	0.188	0.217	0.132	0.172	0.14	0.105
PCCMP-2	0.1	0.24	0.24	0.35	0.15	0.198	0.32	0.138	0.126	0.27	0.208
PCCMP-3	0.1	0.19	0.26	0.36	0.13	0.184	0.302	0.212	0.179	0.18	0.295
PCCMP-4	0.09	0.25	0.23	0.3	0.13	0.232	0.283	0.132	0.194	0.17	0.41
PCCMP-5	0.09	0.25	0.25	0.35	0.13	0.216	0.285	0.152	0.194	0.25	0.414
PCCMP-6	0.08	0.27	0.27	0.34	0.16	0.202	0.277	0.242	0.138	0.42	0.429
PCCMP-6-D	0.11	0.36	0.25	0.35	0.17	0.197	0.279	-	0.138	0.42	0.43
PCCMP-6-B	0.05	0.06	0.05	0.05	0.05	0.132	0.132	-	0.066	0.13	0.014

Table 4-33

Nitrate + Nitrite Nitrogen Values by Month for Wet Weather during CSOTF Discharge

Site	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Nov-16
PCCMP-1	0.1	0.09	0.15	0.21	0.06	0.264
PCCMP-2	0.14	0.23	0.23	0.23	0.22	0.716
PCCMP-3	0.11	0.13	0.16	0.24	0.14	0.673
PCCMP-4	0.18	0.13	0.15	0.25	0.14	0.66
PCCMP-5	0.17	0.14	0.17	0.26	0.15	0.636
PCCMP-6	0.18	0.1	0.15	0.23	0.15	0.649
PCCMP-6-D	0.2	0.12	0.18	0.24	0.15	0.64
PCCMP-6-B	0.05	0.05	0.05	0.05	0.05	0.014
CSOTF 002	0.13	0.17	-	0.05	0.29	0.575
CSOTF 003	-	-	0.67	-	0.36	0.29

4.3.12 Total Phosphorous

Total Phosphorous in mg/L for dry weather, wet weather, and wet weather during CSOTF discharge are shown in Tables 4-34, 4-35, and 4-36, respectively.

Table 4-34

Total Phosphorous Values by Month for Dry Weather

Site	Oct-15	Nov-15	Jan-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16
PCCMP-1	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
PCCMP-2	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.08	0.03
PCCMP-3	0.06	0.06	0.03	0.03	0.03	0.03	0.04	0.07	0.03	0.03	0.04
PCCMP-4	0.06	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.04	0.05	0.03
PCCMP-5	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.18	0.03	0.03	0.13
PCCMP-6	0.06	0.03	0.03	0.03	0.03	0.03	0.03	0.1	0.03	0.03	0.06
PCCMP-6-D	0.04	0.03	0.03	0.03	0.03	0.03	0.03	-	0.03	0.07	0.03
PCCMP-6-B	0.01	0.03	0.03	0.03	0.03	0.03	0.03	-	0.03	0.03	0.03

Table 4-35

Total Phosphorous Values by Month for Wet Weather

Site	Oct-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	Jun-16	Jul-16	Aug-16	Sep-16	Nov-16
PCCMP-1	0.03	0.03	0.41	0.03	0.03	0.03	0.13	0.03	0.13	0.05	0.05
PCCMP-2	0.15	0.04	0.24	0.03	0.03	0.03	0.12	0.07	0.08	0.04	0.03
PCCMP-3	0.03	0.05	0.16	0.27	0.03	0.03	0.29	0.03	0.23	0.04	0.08
PCCMP-4	0.34	0.03	0.17	0.03	0.03	0.03	0.19	0.03	0.11	0.04	0.14
PCCMP-5	0.08	0.03	0.16	0.03	0.03	0.03	0.16	0.03	0.08	0.05	0.15
PCCMP-6	0.03	0.03	0.16	0.03	0.03	0.03	0.05	0.03	0.03	0.08	0.16
PCCMP-6-D	0.03	0.03	0.16	0.03	0.03	0.03	0.03	-	0.03	0.09	0.16
PCCMP-6-B	0.03	0.03	0.03	0.03	0.03	0.03	0.03	-	0.03	0.03	0.03

Table 4-36

Total Phosphorous Values by Month for Wet Weather during CSOTF Discharge

Site	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Nov-16
PCCMP-1	0.04	0.11	0.1	0.09	0.14	0.26
PCCMP-2	0.04	0.13	0.11	0.05	0.13	0.21
PCCMP-3	0.44	0.1	0.15	0.06	0.17	0.22
PCCMP-4	0.11	1.29	0.15	0.04	0.18	0.22
PCCMP-5	0.13	0.12	0.19	0.14	0.17	0.23
PCCMP-6	0.06	0.13	0.18	0.07	0.18	0.22
PCCMP-6-D	0.06	0.11	0.23	0.06	0.18	0.19
PCCMP-6-B	0.01	0.03	0.03	0.03	0.03	0.03
CSOTF 002	1.13	3.04	-	3.78	1.31	0.35
CSOTF 003	-	-	0.11	-	0.15	0.14

4.3.13 Dissolved Phosphorous

Dissolved Phosphorous in mg/L for dry weather, wet weather, and wet weather during CSOTF discharge are shown in Tables 4-37, 4-38, and 4-39, respectively.

Table 4-37

Dissolved Phosphorous Values by Month for Dry Weather

Site	Oct-15	Nov-15	Jan-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16
PCCMP-1	0.01	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
PCCMP-2	0.02	0.03	0.03	0.07	0.03	0.03	0.03	0.03	0.04	0.03	0.03
PCCMP-3	0.04	0.03	0.03	0.03	0.05	0.03	0.03	0.03	0.03	0.03	0.03
PCCMP-4	0.02	0.03	0.03	0.03	0.07	0.03	0.03	0.03	0.03	0.03	0.03
PCCMP-5	0.02	0.03	0.03	0.03	0.08	0.03	0.03	0.03	0.03	0.03	0.03
PCCMP-6	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
PCCMP-6-D	0.02	0.03	0.03	0.03	0.03	0.03	0.03	-	0.03	0.03	0.03
PCCMP-6-B	0.01	0.03	0.03	0.03	0.03	0.03	0.03	-	0.03	0.03	0.03

Table 4-38

Dissolved Phosphorous Values by Month for Wet Weather

Site	Oct-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	Jun-16	Jul-16	Aug-16	Sep-16	Nov-16
PCCMP-1	0.03	0.03	0.24	0.03	0.04	0.06	0.27	0.03	0.03	0.03	0.03
PCCMP-2	0.03	0.03	0.52	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.03
PCCMP-3	0.03	0.03	0.13	0.03	0.03	0.09	0.05	0.03	0.21	0.03	0.03
PCCMP-4	0.03	0.03	0.14	0.03	0.03	0.09	0.13	0.03	0.07	0.03	0.11
PCCMP-5	0.03	0.03	0.03	0.03	0.03	0.06	0.03	0.03	0.04	0.03	0.15
PCCMP-6	0.03	0.03	0.07	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.22
PCCMP-6-D	0.03	0.03	0.07	0.03	0.03	0.03	0.03	-	0.03	0.05	0.21
PCCMP-6-B	0.03	0.03	0.03	0.03	0.03	0.03	0.03	-	0.03	0.03	0.03

Table 4-39

Dissolved Phosphorous Values by Month for Wet Weather during CSOTF Discharge

Site	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Nov-16
PCCMP-1	0.04	0.07	0.03	0.03	0.1	0.03
PCCMP-2	0.02	0.03	0.08	0.03	0.09	0.03
PCCMP-3	0.34	0.04	0.14	0.06	0.1	0.03
PCCMP-4	0.11	0.37	0.16	0.03	0.07	0.03
PCCMP-5	0.21	0.09	0.14	0.07	0.13	0.03
PCCMP-6	0.16	0.06	0.15	0.06	0.15	0.03
PCCMP-6-D	0.16	0.08	0.15	0.09	0.15	0.03
PCCMP-6-B	0.01	0.03	0.03	0.03	0.03	0.03
CSOTF 002	1.43	2.36	-	2.92	0.99	0.04
CSOTF 003	-	-	0.09	-	0.05	0.06

4.3.14 E.coli

E.coli in mpn/100ml for dry weather, wet weather, and wet weather during CSOTF discharge are shown in Tables 4-40, 4-41, and 4-42, respectively.

Table 4-40

E.coli Values by Month for Dry Weather

Site	Oct-15	Nov-15	Jan-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16
PCCMP-1	148	126	104	104	20	244	216	170	62	126	126
PCCMP-2	104	104	194	104	170	148	296	20	196	104	104
PCCMP-3	148	168	172	20	104	104	150	126	2220	244	146
PCCMP-4	322	172	312	432	196	402	8700	550	290	264	104
PCCMP-5	398	244	194	194	316	170	672	82	148	62	20
PCCMP-6	150	126	196	168	20	216	194	104	218	20	40
PCCMP-6-D	268	196	390	122	82	126	310	-	218	20	40
PCCMP-6-B	1	1	1	1	1	1	1	-	1	1	1

Table 4-41

E.coli Values by Month for Wet Weather

Site	Oct-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	Jun-16	Jul-16	Aug-16	Sep-16	Nov-16
PCCMP-1	2160	216	6150	60	6150	856	316	378	576	1760	6900
PCCMP-2	3000	1680	4130	40	4560	1870	290	82	172	2630	2970
PCCMP-3	2630	992	3210	62	7310	1350	216	462	672	1540	5230
PCCMP-4	2290	1090	2880	374	6150	852	844	746	2520	2140	7310
PCCMP-5	1980	864	2710	148	5820	1470	172	570	1130	2220	8210
PCCMP-6	2360	1550	3450	150	4370	862	40	20	270	11000	12300
PCCMP-6-D	2150	1350	2930	62	4760	1010	62	-	292	9220	11600
PCCMP-6-B	1	1	1	1	1	1	1	-	1	1	1

Table 4-42

E.coli Values by Month for Wet Weather during CSOTF Discharge

Site	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Nov-16	Dec-16
PCCMP-1	2340	8210	4200	850	1990	12600	980
PCCMP-2	34700	14500	8700	630	12400	13500	630
PCCMP-3	48400	48400	15400	3690	16600	112000	5040
PCCMP-4	48400	34700	12300	2690	13700	92100	-
PCCMP-5	48400	28300	22400	1870	13100	61300	-
PCCMP-6	48400	28300	31100	1870	15200	81600	-
PCCMP-6-D	48400	28300	28300	1870	12800	61300	-
PCCMP-6-B	1	1	1	1	1	1	-
CSOTF 002	48400	48400	-	242000	242000	260000	484000
CSOTF 003	-	-	199000	-	10800	173000	-

4.3.15 Oil and Grease

Oil and Grease in mg/L for dry weather, wet weather, and wet weather during CSOTF discharge are shown in Tables 4-43, 4-44, and 4-45, respectively.

Table 4-43

Oil & Grease Values by Month for Dry Weather

Site	Oct-15	Nov-15	Jan-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16
PCCMP-1	5	5	5	5	5	5	5	5	16.8	5	5
PCCMP-2	5	5	5	5	5	5	5	5	20.8	5	5
PCCMP-3	5	5	5	5	5	5	5	5	18	5	5
PCCMP-4	5	5	5	5	5	5	5	5	18.4	5	5
PCCMP-5	5	5	5	5	5	5	5	5	20.8	5	5
PCCMP-6	5	5	5	5	5	5	5	5	16.8	5	5
PCCMP-6-D	5	5	5	5	5	5	5	-	14.8	5	5
PCCMP-6-B	5	5	5	5	5	5	5	-	16.8	5	5

Table 4-44

Oil & Grease Values by Month for Wet Weather

Site	Oct-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	Jun-16	Jul-16	Aug-16	Sep-16	Nov-16
PCCMP-1	5	5	5	5	5	5	5	5	5	5	6.8
PCCMP-2	5	5	8	5	5	5	5	5	5	5	9.6
PCCMP-3	5	5	6.8	5	5	5	5	5	5	5	5.6
PCCMP-4	5	5	6	5	5	5	5	5	5	5	12.4
PCCMP-5	5	5	7.6	11.6	5	5	5	5	5	5	5
PCCMP-6	5	5	9.2	5	5	8.8	5	5	5	5	5
PCCMP-6-D	5	5	8.8	5	5	8	5	-	5	5	5
PCCMP-6-B	5	5	5	16.8	5	5	5	-	5	5	5

Table 4-45

Oil & Grease Values by Month for Wet Weather during CSOTF Discharge

Site	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Nov-16
PCCMP-1	5	5	5	5	5	5
PCCMP-2	5	5	5	5	5	5
PCCMP-3	10	5	5.2	5	5	5
PCCMP-4	5	5	5	5	5	5
PCCMP-5	12.5	5	5	5	5	5
PCCMP-6	5.6	5	5	5	5	5
PCCMP-6-D	5	5	5	5	5	5
PCCMP-6-B	5	5	5	5	5	5
CSOTF 002	13.3	11	-	5	10.4	5
CSOTF 003	-	-	8.4	-	6	5

4.3.16 UV-Absorbing Constituents

UV-Absorbing Constituents in % Trans. For wet weather and wet weather during CSOTF discharge are shown in Table 4-46.

Table 4-46

UV-Absorbing Constituents Values by Month for Wet Weather during CSOTF Discharge

Site	Nov-16	Dec-16
CSOTF 002	67	40.5
CSOTF 003	80.2	-

4.4 Performance Monitoring Data

Performance monitoring data includes the data from section 4.3 and 4.5.

4.5 Outfall Activation

Collection of data for CSOTF discharges began in October 2015. For that portion of the year, the CSOTFs discharged to Chattanooga Creek six (6) times. The CSOTFs discharged to Chattanooga Creek twelve (12) times during the reporting period (2016). Nine (9) of those times were from Central CSO (002), and three (3) times were from Williams St CSO (003). These discharge events are shown in Table 4-47 below.

Table 4-47

CSOTF Discharges into Chattanooga Creek

Day	Location of Discharge	Start Time	End Time	Gallons Discharged	Duration (hrs)	Discharge Type
03-Oct-15	Central CSO (002)	10:55	21:31	5,304,244	18.3	Treated

Day	Location of Discharge	Start Time	End Time	Gallons Discharged	Duration (hrs)	Discharge Type
18-Nov-15	Central CSO (002)	16:01	15:26	8,401,237	23.35	Treated
29-Nov-15	Central CSO (002)	22:53	23:59	8,297,058	25.1	Treated
01-Dec-15	Central CSO (002)	8:34	14:30	8,118,385	5.93	Treated
01-Dec-15	Williams St CSO (003)	18:03	10:33	2,441,000	112.52	Treated
25-Dec-15	Williams St CSO (003)	12:03	23:59	7,873,000	155.97	Treated
22-Jan-16	Central CSO (002)	09:29	21:34	2,736,291	9.76	Treated
26-Jan-16	Central CSO (002)	15:23	23:49	439,799	5.05	Treated
03-Feb-16	Central CSO (002)	00:40	05:06	11,584,967	4.43	Treated
03-Feb-16	Williams St CSO (003)	03:35	11:44	11,890,450	8.15	Treated
23-Feb-16	Central CSO (002)	20:37	00:51	5,338,533	4.23	Treated
23-Feb-16	Williams St CSO (003)	23:05	06:30	9,557,882	7.43	Treated
12-May-16	Central CSO (002)	17:07	19:56	1,886,181	2.82	Treated
08-Aug-16	Central CSO (002)	01:16	02:16	1,185,692	1	Treated
29-Nov-16	Central CSO (002)	13:38	13:45	4,850	0.12	Treated
30-Nov-16	Central CSO (002)	04:16	23:58	23,266,525	19.7	Treated
30-Nov-16	Williams St CSO (003)	08:11	09:59	1,637,199	1.8	Treated
04-Dec-16	Central CSO (002)	16:22	12:12	13,199,108	67.83	Treated

4.6 Rainfall Data

The PCCMP uses ADS rain gauge 11 (RG11) to determine when to sample because this gauge is closest to the project area. A map detailing the location of RG11 can be found in Figure 4-1, below. Table 4-48 shows the measured statistical values of rainfall data based on RG11, and Table 4-49 shows the rain event distribution by depth. For purposes of this report, only 2016

rainfall data is included, but all applicable rainfall data will be incorporated into the AOP analysis, as needed.

Figure 4-1

Location of RG11 and Flow Monitor



Table 4-48

Statistical Metrics of Rainfall Data for RG11

Statistical Metric	Value
Annual Rainfall Total Depth (in.):	39.32
Annual Average Intensity (in./hr.):	0.089
Annual Average Event Duration (hr.):	12
Total Number of Events:	46
Maximum Event Depth (in.):	3.31

Table 4-49

Rain Event Distribution by Depth for RG11

Date	Storm Total (in)	Duration (hr)	Intensity (in/hr)
1/9/2016	0.73	48	0.015
1/15/2016	0.3	12	0.025
1/20/2016	0.2	14	0.014
1/22/2016	1.98	23	0.086

Date	Storm Total (in)	Duration (hr)	Intensity (in/hr)
1/26/2016	0.93	18	0.052
2/3/2016	2.92	14	0.209
2/16/2016	1.56	20	0.078
2/16/2016	0.15	4	0.038
2/24/2016	3.15	40	0.079
3/1/2016	0.4	12	0.033
3/3/2016	0.17	10	0.017
3/10/2016	0.25	4	0.063
3/13/2016	0.51	9	0.057
3/14/2016	0.25	5	0.050
3/25/2016	0.86	11	0.078
3/27/2016	0.26	4	0.065
4/1/2016	1.19	19	0.063
4/6/2016	0.61	3	0.203
4/12/2016	0.27	15	0.018
4/14/2016	0.18	10	0.018
4/22/2016	0.29	12	0.024
5/1/2016	0.12	7	0.017
5/3/2016	0.58	17	0.034
5/5/2016	0.16	8	0.020
5/12/2016	0.86	9	0.096
5/20/2016	0.33	12	0.028
6/2/2016	0.15	14	0.011
6/2/2016	0.13	6	0.022
6/5/2016	0.85	33	0.026
6/15/2016	0.11	3	0.037
6/24/2016	0.39	3	0.130
7/18/2016	0.09	1	0.090
8/8/2016	3.31	6	0.552
8/18/2016	0.27	6	0.045
9/11/2016	0.65	3	0.217
9/18/2016	0.86	3	0.287
9/26/2016	0.72	2	0.360
11/29/2016	1.39	8	0.174
11/30/2016	3.08	17	0.181
12/4/2016	1.33	28	0.048
12/6/2016	1.39	27	0.051
12/12/2016	0.44	7	0.063
12/18/2016	0.74	11	0.067
12/27/2016	0.4	5	0.080

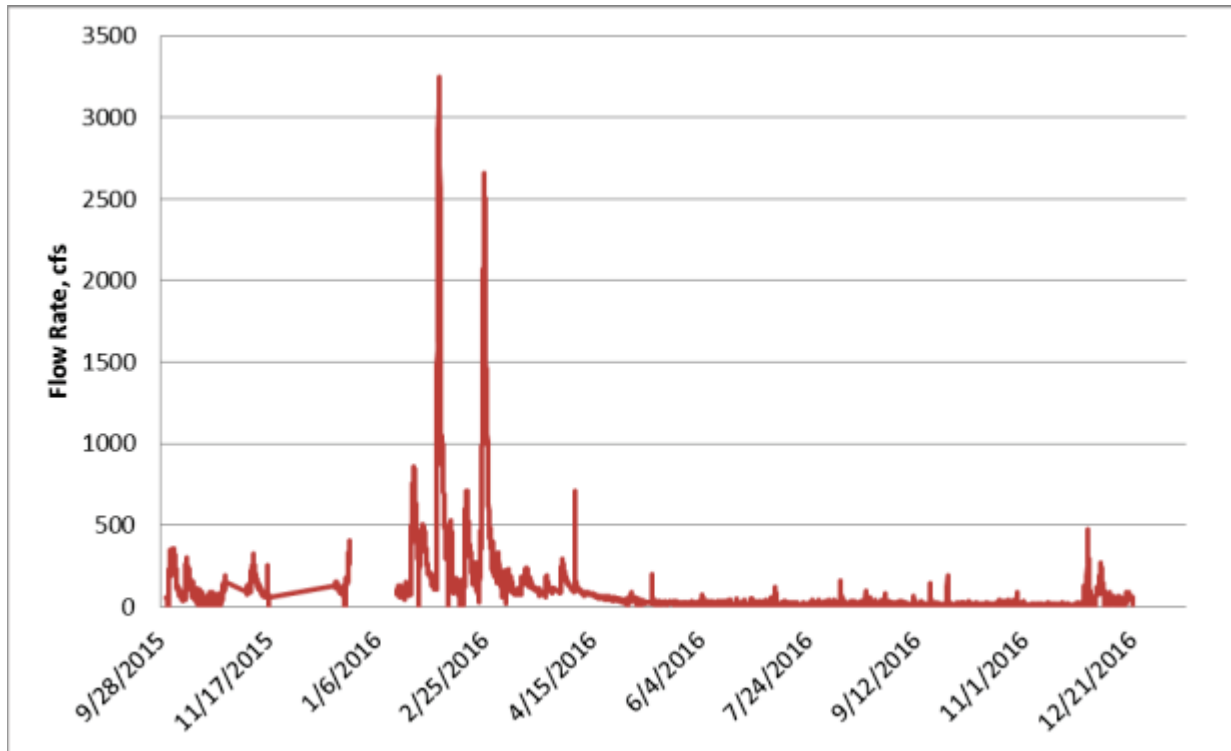
Date	Storm Total (in)	Duration (hr)	Intensity (in/hr)
12/29/2016	0.45	3	0.150
12/31/2016	0.26	6	0.043

4.7 Flow Monitoring

A Channel Master flow monitor was installed in Chattanooga Creek that measures the stage and velocity of the creek in order to gage the instantaneous flow needed for model inputs. A map depicting the location of the flow monitor can be found in Figure 4-1, above. Figures 4-2, 4-3, and 4-4 depict the flow, velocity, and depth measured at this flow meter from October 2015 through 2016. Data discrepancies at the beginning of the monitoring period were due to battery malfunctions at the site that were remedied via trial and error by January 2016.

Figure 4-2

Flow Rate in cfs at Flow Monitor

**Figure 4-3**

Velocity in ft/s at Flow Monitor

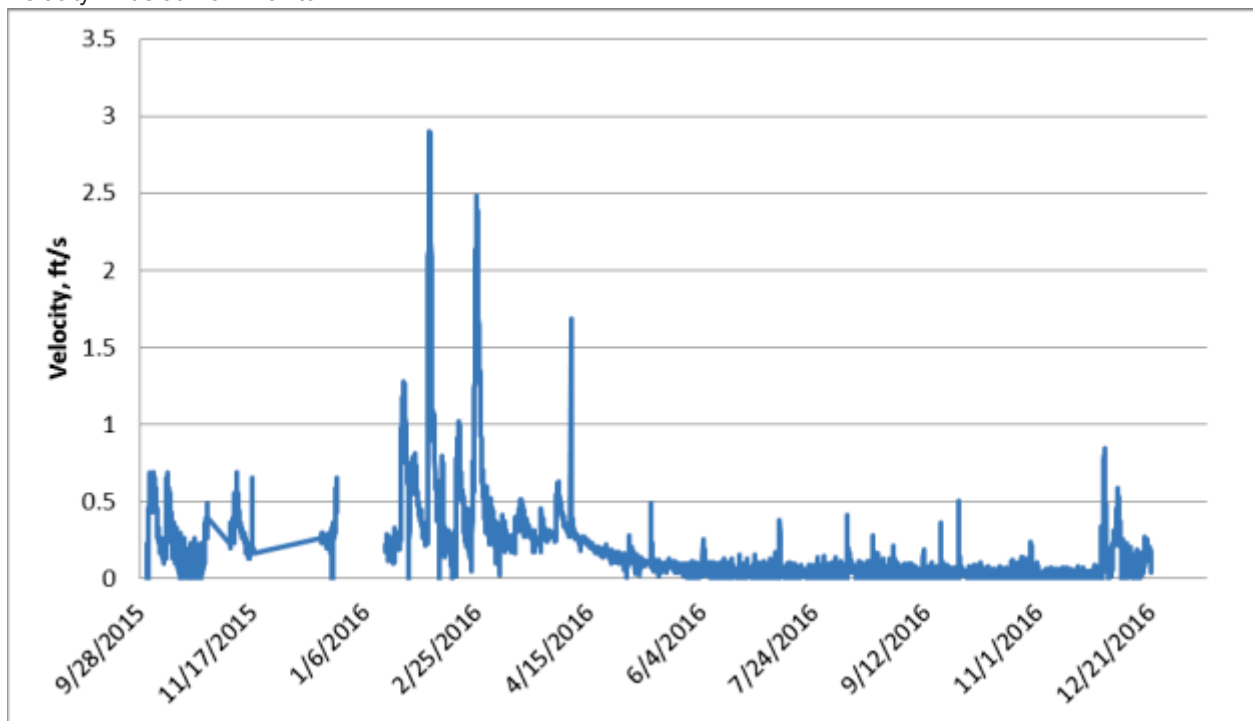


Figure 4-4

Depth in inches at Flow Monitor

